For industrial equipment Automatic fire extinguishing system: Able

ABLE

24-hours full support for fire-protection of industrial equipment

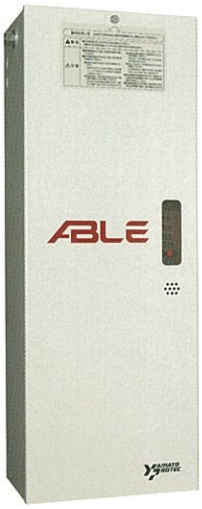
New product!

Infrared 3-wavelength-type flame detector (FR3-S) was newly added.

ヤマトプロテック株式会社

To promptly respond to any fire from various kind of industrial equipment
Full automatic fire-extinguishing system "ABLE"

In recent years, capabilities of industrial equipment have been improving. Industrial devices are increasingly able to be controlled by electronic devices, and are becoming more efficient in terms of reducing labor, and some are now even able to be run without an operator.
Yamato Protec has developed a compact automatic fire extinguishing system, called ABLE, that delivers outstanding performance for all types of industrial equipment.



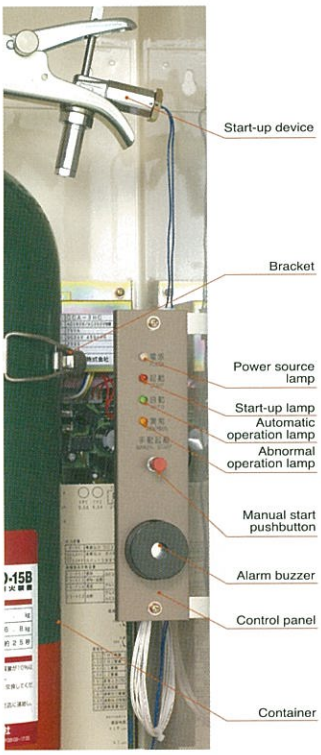
Selectable extinguishing agents
According to the characteristic of the industrial equipment concerned, you can select from "carbon dioxide fire-extinguishing agent", fire-extinguishing foam", and "powder (ABC) fire-extinguishing agent".

Fire can be promptly detected and extinguished
A high precision semiconductor device (thermister) is adopted as a sensor. It catches an outbreak of a fire with very prompt response, and automatically discharges a fire-extinguishing agent and extinguishes the fire.

Compact design
We realized a compact design in order to make it easier for the system to be installed on a fire-protective object.

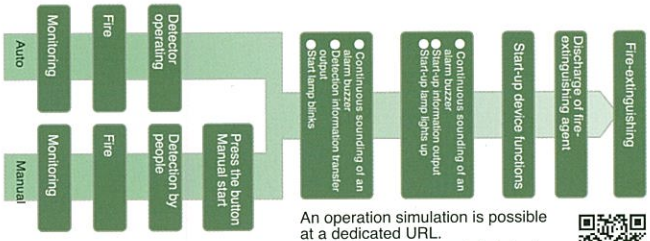
Characteristics of ABLE

❶ Since it is a simple function, it can extinguish the fire quickly and certainly.
❷ Since up to five additional agent cylinders can be interlocked, the optimal quantity of agent is ensured
❸ A buzzer sounds at the time of abnormalities (power source light blinks).
❹ Officially approved sensors such as smoke sensor, heat detector and flame sensor are connected.
❺ By means of a dedicated thermister sensor, a wide range of temperature setting (operating temperature: 60oC - 120oC) is possible according to installation environments. Moreover, if a high-temperature type (optional) sensor is used, it can respond to at the maximum temperature of 300oC.
❻ It always monitors any abnormalities of external devices (disconnection surveillance: thermister detector, fire detection sensor, remote control box, and start-up device) to ensure high reliability.
❼ The AND/OR setting of the sensory circuit can be switched.
❽ A setup of starting delay time is possible.
❾ The starting setup can be switched between automatic/manual.
❿ It has a built-in function which always monitors disconnection, loose connection, etc. and indicates any unusual parts individually.
⓫ As a measure against a power failure, a reserve power supply



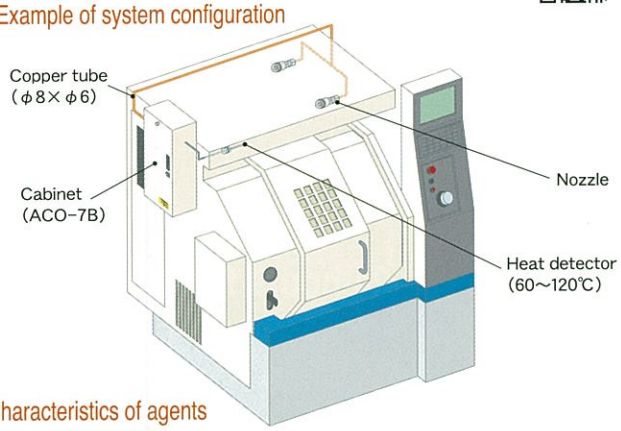
* The photo shows ACO-15B.

Basic operation system



An operation simulation is possible at a dedicated URL.
http://yp-vt.net/able/

Example of system configuration



Characteristics of agents

Carbon dioxide

There is no dirt or damage after fire extinguishing and every equipment or device which was not affected by the fire and heat can be used immediately.
Since carbon dioxide is stable gas, it does not exert a chemical change on metal and electrical equipment, as well as oil and other substances. There is almost no aged deterioration in the usual storing condition, and the maintenance is easy. It has electrical insulation properties.

Foam

Because of suffocation and chilling effect, there is no re-ignition.
Since only water washing is needed, the treatment after use is easy.
It is excellent at evaporation control effect of flammable vapor.

Powder

Powder is especially superior to other fire-extinguishing agent in the instantaneous effect, and can perform quick fire extinguishing. There is almost no performance degradation by a temperature change, and it can be used at ease even in a cold district. It is harmless and safe to human and animals.

Selection of ABLE

An adapted fire-extinguishing agent and detection sensor may differ depending on an object on which an ABLE is installed for fire protection., The model and the quantity of the fire-extinguishing agent need to be selected according to situations, such as the size of the aforementioned object and a kind of combustibles. The following table shows a list of basic corresponding models. In response to your request, we will deliver the optimal design to you.

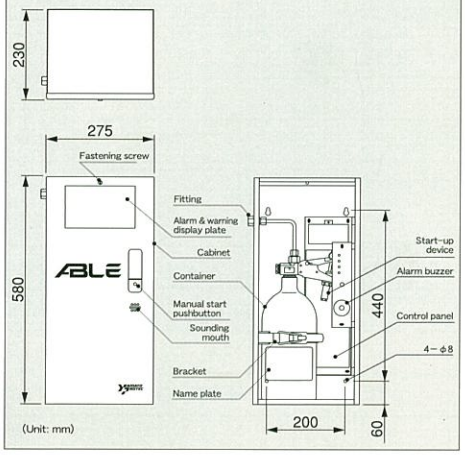
	ACO-OOB	AFF-6B	ADC-20B
Small machine tool	○		
NC lathe	○		
Finishing lathe	○		
Machining center	○		
Grinding machine	○		
Dust collector	○		
Automatic soldering tub	○		
Various test machines	○		
Semiconductor manufacturing equipment	○		
Washer	○	○	
Printer	○	○	
Thermostat	○		○
Dryer	○		○
Ventilation duct	○		○

* Restricted to small machines.

Carbon dioxide Extinguishing agent

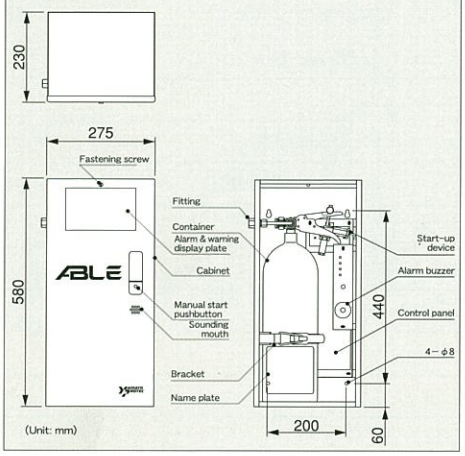
ModelACO-4B

Carbon dioxide fire-extinguishing agent・2.0kg
Machine tool・General industrial equipment, etc.



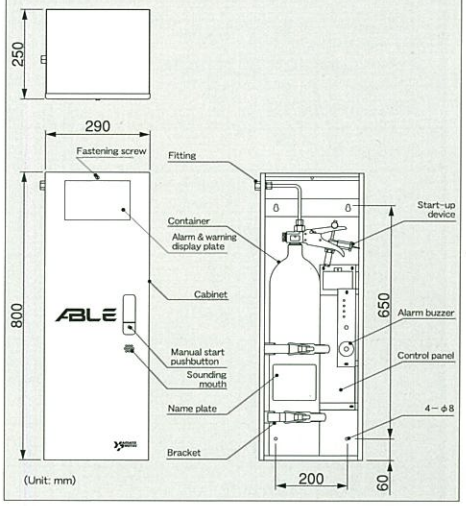
ModelACO-7B

Carbon dioxide fire-extinguishing agent・3.2kg
Machine tool・General industrial equipment, etc.



ModelACO-10B

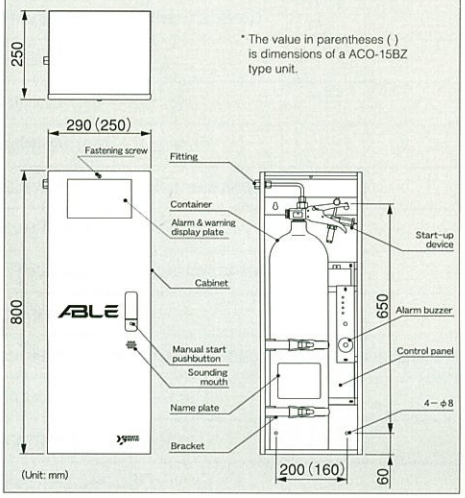
Carbon dioxide fire-extinguishing agent・4.6kg
Machine tool・General industrial equipment, etc.



ModelACO-15B　ModelACO-15BZ

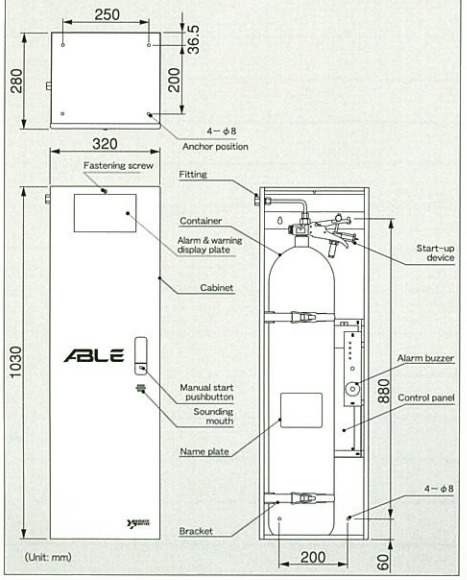
Carbon dioxide fire-extinguishing agent・6.8kg
Machine tool・General industrial equipment, etc.

* There are no manual starting push button, sound mouth, alarm buzzer, or control panel in the model ACO-15BZ (extended type) fire-extinguisher. A gas generator start-up unit is mounted.



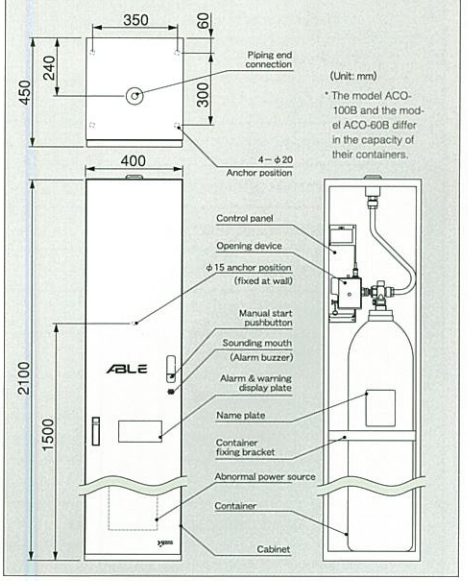
ModelACO-30B

Carbon dioxide fire-extinguishing agent・13.3kg
Machine tool・General industrial equipment, etc.



ModelACO-60B　ModelACO-100B

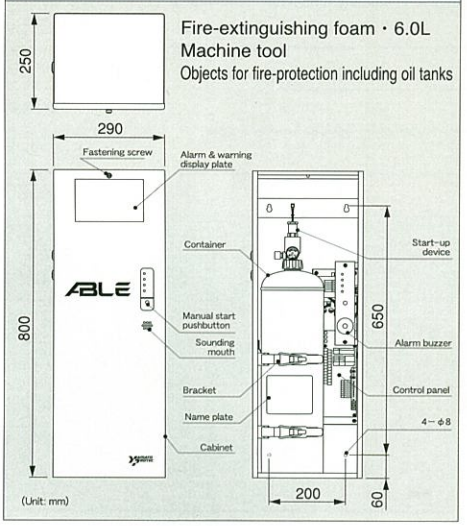
Carbon dioxide fire-extinguishing agent・28.0kg(60B)・45.0kg(100B)
Machine tool・General industrial equipment, etc.



Foam (foam on machine)

ModelAFF-6B

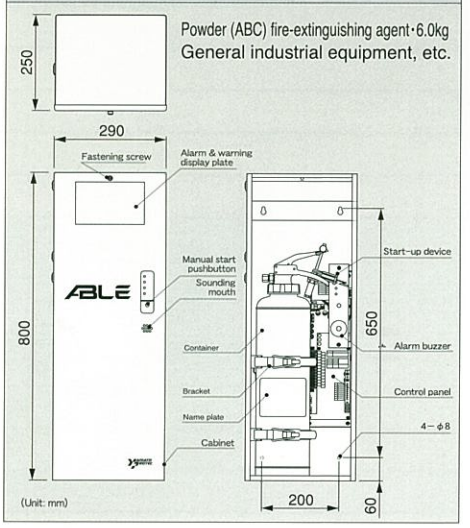
Fire-extinguishing foam・6.0L
Machine tool
Objects for fire-protection including oil tanks



Powder (ABC)

ModelADC-20B

Powder (ABC) fire-extinguishing agent・6.0kg
General industrial equipment, etc.



Specification

Item \ Model	ACO-4B	ACO-7B	ACO-10B
			H
Extinguishing agent			
Volume of Extinguishing agent	2.0kg	3.2kg	4.6kg
External dimensions of cabinet	580×275×230mm	580×275×230mm	800×290×250mm
Gross weight	About 16.8kg	About 19.5kg	About 26.0kg
Initiated by			
Nozzle			1／4(
Discharge time	About 8 seconds	About 11 seconds	About 17 seconds
Connection pipe			Attached copp
Type of connection pipe			Phosphorus deoxidiz
Fitting type			Press
Control panel — Model			
Control panel — Input power			AC100/AC200±10% 50/60Hz chang
Control panel — Power consumption			
Control panel — Capacity of external output power			
Control panel — Manual start pushbutton			Red momentary p
Control panel — Auto/manaul switch			Toggle with gold contacts Set to
Control panel — Alarm buzzer			Beeper with a sou
Control panel — Power lamp			Lights up green when AC power is s
Control panel — Start light			Blinks red when fire is d
Control panel — Automatic operation lamp			Lights up gre
Control panel — Abnormal operation lamp			Light up yellow
Control panel — In-panel indication lamp			Operating lamp: 5
Control panel — Sensor input 1			Two system: Thermister heat detect
Control panel — Sensor input 2			One system: Signal con
Control panel — Temperature setting volume			Arbitrary setup at 60 ° C - 120 ° C of
Control panel — Output at initiation			Connection f
Control panel — Input of remote auto/manual changeover			Remote changeover to the manual operation is possible. (pc
Control panel — Interlock output			Interlocking devic
Control panel — Transfer of detection information			DC30V1A(changeov
Control panel — Transfer of alarm information			DC30V2.5A(changeo
Control panel — Transfer of detection, start-up and discharge information			DC30V1A(changeover between a and b cont
Control panel — Transfer of abnormal information			DC30V1A(changeover between a and b contact point
Control panel — Usable temperature range			0～
Control panel — Delaying timer circuit			Arbitrar
Control panel — Mode setting circuit			Possible v
Control panel — Standby power supply			with a c
Thermister heat detector			DTA-2 1 piece is att
Options — Thermister heat detector			DTA-2(ser
Options — Signal converter			Work temperat
Options — Remote operation box			
Options — Interlinking device			Gas ger
Options — Fire detector			Constant tempe
Options — System shutdown signal			Resp
Options — Standby power supply			Nickel-cad

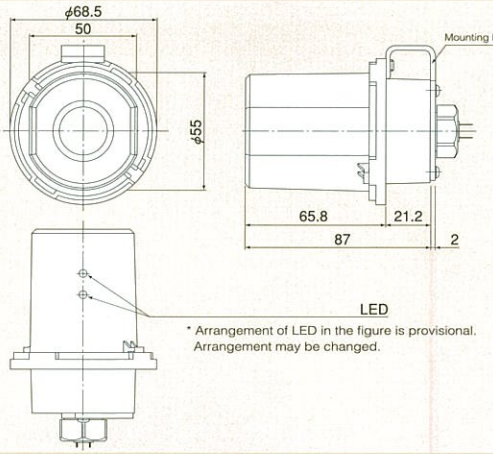
	ACO-15B	ACO-30B	ACO-60B・100B	ACO-15BZ
-function type				Extended type
bon dioxide				Carbon dioxide(CO2)
	6.8kg	13.3kg	28.0kg(60B)・45.0kg(100B)	6.8kg
	800×290×250mm	1030×320×280mm	2100×400×450mm	800×250×250mm
	About 32.5kg	About 53.0kg	About 175kg/About 215kg	About 30.0kg
s generator			Start-up by solenoid	
ttached 2 pieces)		1／4C25(attached 4 pieces)	(Gas system's injection head)	
	About 25 seconds	About 30 seconds	————	About 25 seconds
pe: Φ8 x Φ6, 10 meter long			Steel pipe 25A (1B)	
opper seamless pipe(JIS H3300)			JIS G 3454 sch80	
sing bite-type ring			Connection with screws	
GCA-3HG				MC-K
r type Set to AC200V at the time of shippingAC200				(Supplied from GCA-3)
ax 26VA				max 0.2VA
4V max0.1A				————
utton switch with gold contacts				————
automatic operation at the timew of shipping				————
ressure level of 85 dB or above				————
ed Lights up red when standby power is supplied				————
ed Lights up red when being started				————
uring automatic monitoring				————
any abnormality is detected				————
es Abnormality lamp: 9 pieces				Power lamp・Start light・Abnormal operation lamp
R operation Set to 120° C at the time of shipping				————
for extension・For other fire detectors				————
ating temperature is possible with "sensor input 1" .				————
nnector (1 gas generator)				
e when the change-over SW on the control panel is in the automatic mode)				————
C-K) 5 units can be connected				————
tween a and b contact points)×1				————
etween a and b contact points)×1				————
oints)×1 Start-up/detection information changeover type				————
Power OFF and power failure (changeover of disconnected lines)				————
no consensation)				
ing to 0 - 99 seconds				————
ND/OR changeover SW				————
tor for standby power				————
(service temperature: 0 - 250° C)				————
emperature: 0 - 250° C)				————
0° C - 120° C, arbitrary set				————
RC-5				————
r start-up unit(MC-K)				————
spot Smoke and fire detector				————
le by using a relay				————
battery(DC24V/0.45Ah)				————

Specification

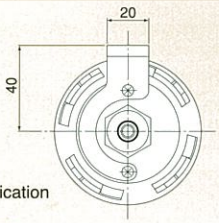
Item \ Model		AFF-6B	ADC-20B
		High-function type	
Extinguishing agent		Foam (foam on machine)	Powder (ABC)
Volume of Extinguishing agent		6.0L	6.0kg
External dimensions of cabinet		800×290×250mm	
Gross weight		About 24.0kg	
Initiated by		Gas generator	
Nozzle		1/4EX (attached 4 pieces)	DG-3 (attached 2 pieces)
Discharge time		About 35 seconds	About 25 seconds
Connection pipe		Attached copper pipe: Φ8 x Φ6, 10 meter long	
Type of connection pipe		Phosphorus deoxidized copper seamless pipe(JIS H3300)	
Fitting type		Press-fit using bite-type ring	
Control panel	Model	GCA-3HG	
	Input power	AC100/AC200±10% 50/60Hz changeover type Set to AC200V at the time of shippingAC200	
	Power consumption	max 26VA	
	Capacity of external output power	DC24V max0.1A	
	Manual start pushbutton	Red momentary pushbutton switch with gold contacts	
	Auto/manaul switch	Toggle with gold contacts Set to the automatic operation at the timew of shipping	
	Alarm buzzer	Beeper with a sound pressure level of 85 dB or above	
	Power lamp	Lights up green when AC power is supplied Lights up red when standby power is supplied	
	Start light	Blinks red when fire is detected Lights up red when being started	
	Automatic operation lamp	Lights up green during automatic monitoring	
	Abnormal operation lamp	Light up yellow when any abnormality is detected	
	In-panel indication lamp	Operating lamp: 5 pieces Abnormality lamp: 9 pieces	
	Sensor input 1	Two system: Thermister heat detector OR operation Set to 120° C at the time of shipping	
	Sensor input 2	One system: Signal conveter for extension･For other fire detectors	
	Temperature setting volume	Arbitrary setup at 60 ° C - 120 ° C of operating temperature is possible with "sensor input 1" .	
	Output at initiation	Connection for connector (1 gas generator)	
	Input of remote auto/manual changeover	Remote changeover to the manual operation is possible. (possible when the change-over SW on the control panel is in the automatic mode)	
	Interlock output	Interlocking device(MC-K) 5 units can be connected	
	Transfer of detection information	DC30V1A(changeover between a and b contact points)×1	
	Transfer of alarm information	DC30V2.5A(changeover between a and b contact points)×1	
	Transfer of detection, start-up and discharge information	DC30V1A(changeover between a and b contact points)×1 Start-up/detection information changeover type	
	Transfer of abnormal information	DC30V1A(changeover between a and b contact points)×1 Power OFF and power failure (changeover of disconnected lines)	
	Usable temperature range	0～40℃(no consensation)	
	Delaying timer circuit	Arbitrary setting to 0 - 99 seconds	
	Mode setting circuit	Possible with AND/OR changeover SW	
	Standby power supply	with a conenctor for standby power	
Thermister heat detector		DTA-2 1 piece is attached(service temperature: 0 - 250° C)	
Options	Thermister heat detector	DTA-2(service temperature: 0 - 250° C)	
	Signal converter	Work temperature: 60° C - 120° C, arbitrary set	
	Remote operation box	RC-5	
	Interlinking device	Gas gĕnerator start-up unit(MC-K)	
	Fire detector	Constant temperature spot Smoke and fire detector	
	System shutdown signal	Responsible by using a relay	
	Standby power supply	Nickel-cadmium battery(DC24V/0.45Ah)About 24.0kg	

■Infrared 3-wavelength-type flame detector (FR3-S type)

It catches mainly three kinds of wavelength domains of characteristic infrared rays of 4.3 μm emitted from a hydrocarbon flame. After arithmetic processing of each signal, this flame detector emits a detection signal if it determines that a fire is occurring.
Since sapphire glass is used for the detection window part, a sealed structure is ensured. This flame detector demonstrates a sufficient performance also in environment with a plenty of dust, oil droplets, etc.



Unit: mm

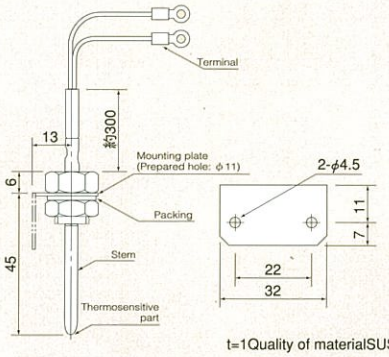


Specification

Item
Flame detector
Model
FR3-S
Detecting method
Infrared 3-wavelength type
Dimensions
ϕ68 × L 89 (mm)
Power supply voltage
DC 24 [V]
Consumption current
Max. 15 [mA]
Detection range
The shape of a corn at a vertex angle of 100 degrees with the center of a detection window.
Detection level
It detects a flame of 5 cm in length within 3 seconds at 1 m from the front.
Structure
Waterproof structure (equivalent to IP67)
Quality of material
Main body: propylene Detection window: sapphire
Operating temperature limit
0~70 (℃)
Connection cable
4-core cabtyre cable: 10m

■Thermistor heat detector (DTA-2)

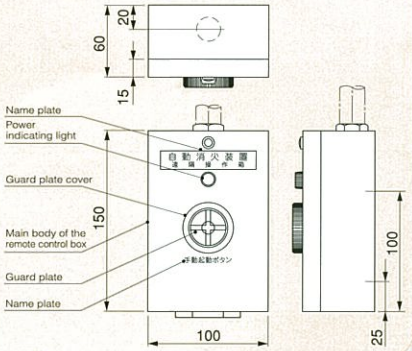
Unit: mm



t=1Quality of materialSUS304

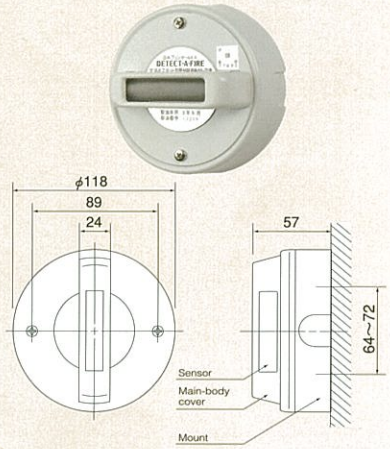
■Remote control box (RC-3)

Unit: mm



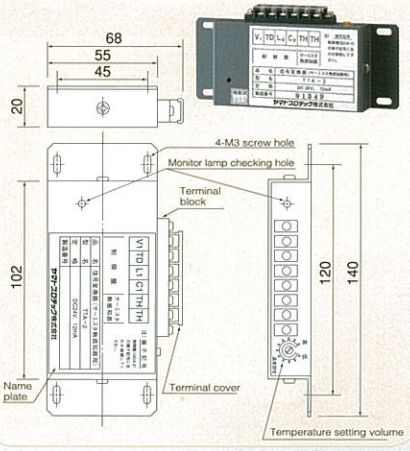
■Hematothermal spot heat detector (Class-1 acid-proof type)

Unit: mm



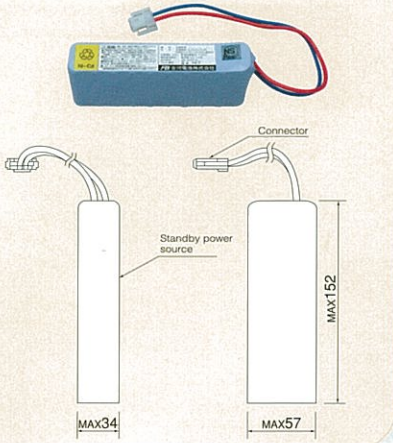
■Signal converter(TTA-2)

Unit: mm

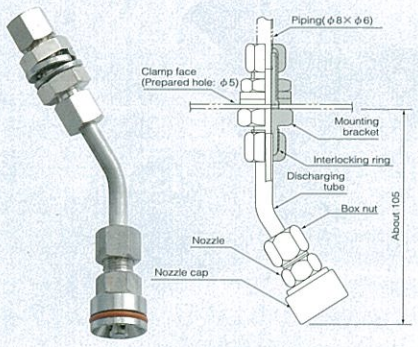


■Standby power source (Nickel-cadmium battery)

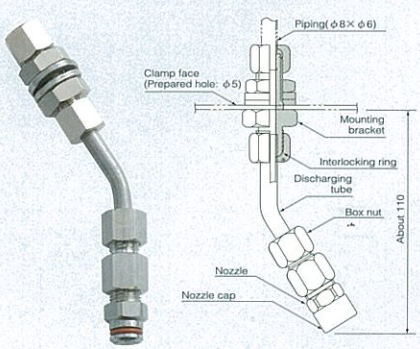
Unit: mm



■Nozzle(1/4C25 type)

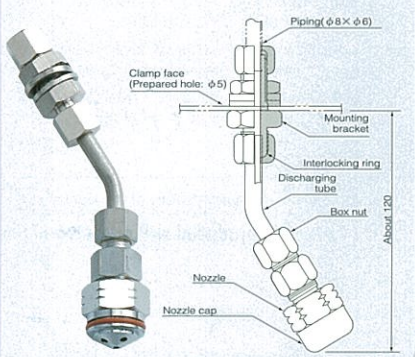


■Nozzle(1/4EX type)



■Nozzle(DG3 type)

Unit: mm



Method for calculating the quantity of fire-extinguishing agent

Carbon dioxide fire-extinguishing agent

1. Whole-area discharging type

The quantity is calculated at a rate shown in the following table. However, when the quantity is turned out to be the value less than that shown in the same table, the quantity shall be as indicated in the minimum limit column of the total quantity of the fire-extinguishing agent concerned.

Volume of protective zone (m³)	Quantity (kg) of fire-extinguishing agent per 1m³ of a protective zone	Minimum limit of fire-extinguishing agent (kg)	Additional quantity (kg)of agent per 1m² of the opening
less than 5	1.2	—	5
5 to less than 15	1.1	6	5
15 to less than 50	1.0	17	5
50 to less than 150	0.9	50	5
150 to less than 1500	0.8	135	5

*1 The fire-extinguishing agent should be stored in the protection zone. Otherwise, according to the type of a hazardous material to be handled, the quantity of the agent can be obtained by multiplying the coefficient indicated in the attached table.

*2 Although the principle is to stop the ventilator in a protection zone before discharging the fire-extinguishing agent, if the equipment cannot be stopped, it is necessary to add the discharging

(Example of calculation)

●Basic quantity of agent

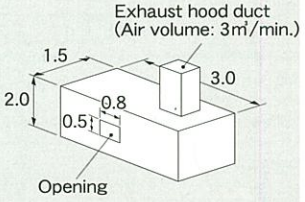
Volume – 2.0m x 1.5m x 3.0m = 9.0m³

Quantity of agent – 9.0m³ x 1.1kg/m³ = 9.9kg

●Quantity to be added at the opening

Area of the opening – 0.5m x 0.8m = 0.4m²

Quantity of agent – 0.4m² x 5.0kg/m² = 2.0kg



Thereby, the quantity of agent needed is 9.9kg +2.0kg = 11.9kg. Moreover, when the fan's operation cannot be stopped, assuming that the air volume of ventilation to be 3m³/min., it is set to 3.0m³/min. x 0.75kg/m³ =2.25kg, and the quantity of agent required in this case will be 11.9kg + 2.25kg = 14.15kg.

2. Local discharging type

The agent in the quantity calculated in the following (1) or (2) multiplied by 1.4 must be stored, or according to the hazardous material to be handled, the quantity more than that obtained by multiplying the coefficient provided in the attached table must be prepared.

1)Area-basis

Quantity calculated at the rate of 13kg per surface area of 1m2 of an object to be protected (if the length of one side of such object is 0.6m or less, the area of the object when assuming the length of the said one side is 0.6m).

2)Volume-basis

Value obtained from the following formula multiplied by the cubic volume of the space to be protected (the space surrounded at a distance of 0.6m from all parts of the object to be protected)

$$Q=8-6\frac{a}{A}$$

Q: Quantity of fire-extinguishing agent per unit volume

a: The total of the area of the fixed side wall (restricted to the side wall located at a distance of within 0.6m or less from the fixed object) actually installed around the object to be protected (unit: m²).

A: The area of the entire circumference of a space to be protected (total of the area where a fixed side wall is actually installed and the area of a portion without the fixed side wall assuming that there is a fixed side wall) (unit: m²).

Fire-extinguishing powder

1. Whole-area discharging type

The quantity is calculated at a rate shown in the following table.

Quantity (kg) of fire-extinguishing agent per 1m³ of a protective zone	Additional quantity (kg)of agent per 1m² of the opening
0.36	2.7

*1 The fire-extinguishing agent should be stored in the protection zone. Otherwise, according to the type of a hazardous material to be handled, the quantity of the agent can be obtained by multiplying the coefficient indicated in the attached table.

2. Local discharging type

The agent in the quantity calculated in the following (1) or (2) multipled by 1.1 must be stored, or according to the hazardous material to be handled, the quantity more than that obtained by multiplying the coefficient provided in the attached table must be prepared.

1)Area-basis

Quantity calculated at the rate of 5.2kg per surface area of 1m2 of an object to be protected (if the length of one side of such object is 0.6m or less, the area of the object when assuming the length of the said one side is 0.6m).

2)Volume-basis

Quantity obtained from the following formula multiplied by the cubic volume of the space to be protected.

$$Q=3.2-2.4\frac{a}{A}$$

Q: Quantity of extinguishing agent per unit volume

a: The total of the area of the fixed side wall actually installed around the object to be protected (unit: m²).

A: The lateral area of the entire circumference of a space to be protected (for a portion without wall, the area of the portion concerned assuming that there is a wall)

Fire-extinguishing foam

The discharge volume of water soluble foam is more than 5L per surface area of 1 m2 of an object.

(Example of calculation)

The size of the usual oil tank is approximately 0.3m³ to 1.6m³. The quantity of the fire-extinguishing forming agent shall be determined in accordance with size of the oil tank.

●In case of 0.3m³ oil tank: 0.3m³ x 5L/m³ = 1.5L
Therefore. one 6L-type oil tank must be installed.

●In case of 1.6m2 oil tank: 1.6m³ x 5L/m³ = 8.0L
herefore. two 6L-type oil tanks must be installed.

*** Attached table**

Coefficient of the gas-system extinguishing agent according to kind of hazardous material

Hazardous material	Carbon dioxide	Powder (class-3)
Acrylonitrile	1.2	1.2
Acetaldehyde		—
Acetonitrile	1.0	1.0
Acetone	1.0	1.0
Aniline		1.0
Isooctane	1.0	
Isoprene	1.0	
Isopropylamine	1.0	
Isopropyl ether	1.0	
Isohexane	1.0	
Isoheptane	1.0	
Isopentane	1.0	
Ethanol	1.2	1.2
Ethyl amine	1.0	
Vinyl chloride		1.0
Octane	1.2	
Gasoline	1.0	1.0
Ethyl formate	1.0	
Propyl formate	1.0	
Methyl formate	1.0	
Light oil	1.0	1.0
Crude oil	1.0	1.0
Acetic acid		1.0
Ethyl acetate	1.0	1.0
Methyl acetate	1.0	
Propylene oxide	1.8	—
Cyclohexane	1.0	
Dimethylamine	1.0	
Dimethyl ether	1.2	—
Dixane	1.6	1.2
Heavy oil	1.0	1.0
Lubricant	1.0	1.0
Tetrahydrofuran	1.0	1.2
Lamp oil	1.0	1.0
Triethylamine	1.0	
Toluene	1.0	1.0
Naphtha	1.0	1.0
Canola oil		1.0
Carbon disulfide	3.0	—
Vinyl ethyl ether	1.2	
Pyridine		1.0
Butanol		1.0
Propanol	1.0	1.0
2-propanol	1.0	
Propylamine	1.0	
Hexane	1.0	1.2
Heptane	1.0	1.0
Benzene	1.0	1.2
Pentane	1.0	1.4
Boiled oil		1.0
Methanol	1.6	1.2
Methyl ethyl ketone	1.0	1.2
Monochloro benzene		1.0

Remarks — ark indicates that any fire-extinguishing agent cannot be used for the hazardous material concerned.
Isopropyl alcohol CO2 coefficient 1.0

* Please note that the specifications of this equipment are subject to change.

*** This catalog is produced with recycled paper**

* We offer a wide range of fire prevention equipment.
For more information, please contact:

YAMATO PROTEC CORPORATION

Head office: 5-17-2 Shiroganedai, Minato-ku, Tokyo Website: http://www.yamatoprotec.co.jp

Osaka, Nagoya, Sapporo, Sendai, Saitama, Yokohama, Shizuoka, Hiroshima, Matsuyama, Fukuoka /
Osaka Factory, Tokyo Factory, Research and Development Center

11-003-1011.S